

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 1/11/10 have been fully considered but they are not persuasive.

Applicants' remarks focus on the claim amendments. The first main argument is regarding the amendment to claim 1 reciting that the sealant is hardened before assembly. First and foremost said limitation is a process limitation in a product claim. Applicants should be aware that in a product by process claim, applicants must show that the process materially alters the product to overcome a rejection made on the product by the prior art, which show the product is known, see MPEP 2113. Applicants then admit that Schmid teaches that the seal is hardened (albeit not fully hardened) before assembly. So whether or not the limitation is afforded patentable weight or not Schmid is already teaching said recitation. Regardless of this it is also clear that Schmid teaches in column 5, line 24, that the seal is "rigid" which is a synonym for hard. It is also noted that the instant specification only states that the seal is hardened, but does not provide a requisite degree of hardening, so therefore if the seal is hardened to any degree it reads on said limitation, if said limitation is afforded patentable weight.

Applicants then state that Schmid does not teach the amendment to claim 24 regarding a retaining portion have a tapered design and further state that said design has criticality. However no support can be found anywhere in the instant specification for the supposed criticality that applicants allege. Conclusory statements are not probative unless supported by facts. See *Ex parte Gray* 10 USPQ 2d 1922 (BPAI

1989); *In re de Blauwe* 222 USPQ 191, 196 (Fed. Cir. 1984); *In re D'Ancicco* 172 USPQ 241 (CCPA 1972); *In re Grunwell* 203 USPQ 1055 (CCPA 1979); *Meitzner v. Mindick* 193 USPQ 17; *In re Brandstandter* 179 USPQ 286, 294 (CCPA 1973); *In re Lindner* 173 USPQ 356; and *In re Smith* 74 USPQ 207.

Applicants then argue the Einhart reference separately from Schmid for the rejection of claim 11. Applicants also present similar arguments arguing Inoue separately from Schmid and Wozniczka separately from Schmid. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that that the bodily incorporation of the Wozniczka reference in Schmid cannot obviate the instant claims, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

The amendments to the claims will be addressed in the grounds of rejection below.

***Claim Objections***

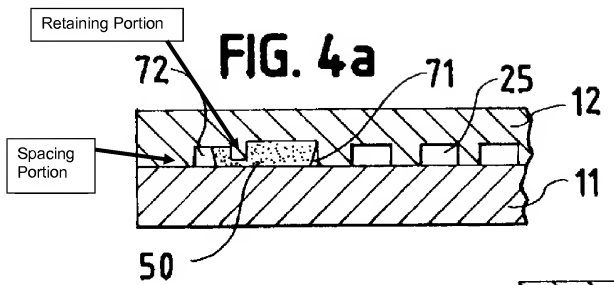
Claim 20 is objected to because of the following informalities: It is noted that the instant specification provides no definition or support for a sealant that is made of a material "that is three dimensionally cross-linked", nor does it list any materials that would have this property. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3, 4, 8, 9, 11-14, and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,080,503 hereinafter Schmid.

Schmid teaches solid polymer electrolyte fuel cell stacks (which as defined by applicants in the instant specification paragraph [0048] is a low temperature type fuel cell) comprising a plurality of components including but not limited to separators and electrolyte membranes with an adhesive material (inherently pressure sensitive) that is elastomeric and is selected for its specific compatibility of physical and chemical characteristics to be used in solid polymer electrolyte fuel cell stacks, said adhesive material being adhesive and interposed between the plurality of fuel cell components wherein a retaining portion and a spacing portion are formed on a surface of a separator plate (illustrated in figure 4a below);



wherein the spacing portion is formed along an outer periphery of the separator, wherein the adhesive material, the spacing portion and the retaining portion are all formed within the fuel cell unit, the stack further comprising manifolds that are formed inside the electrochemically active area and the adhesive material is formed along the outer edge (see column 6, lines 43-46) (since the spacing portion is clearly at an outer periphery of the entire fuel cell unit and the manifold is formed at an interior position such as the electrochemically active area, the spacing portion will clearly be formed outside of the manifold) (see figure 4a, column 1, lines 55-61, column 2, lines 30-33, column 5, lines 12-46, column 6, line 22 – column 8, line 67). Schmid further teaches that the adhesive material can be electrically insulating and is applied across the substantial entire contact surfaces of the separator plates (see column 5, lines 25-26 and line 34 and column 8, lines 35-36). It is also quite clear that Schmid is using the same sealant 50 throughout the entire fuel cell and that said same sealant is also used on one of the components that has the gas passages, see Figures 3a, 3b, 3c, 5a and

5b. It is submitted that the seal of Schmid is capable of being removable due to the breadth of "pressure-sensitive adhesive material" in the Markush groups and the burden is shifted to applicants to show in the form of evidence (not arguments) that the seal of Schmid does not exhibit the properties as recited in claims 1 and 24 that is the sealant material can never be removed.

The examiner notes that claim 1 contains a process limitation in a product claim (the sealant is "hardened before the plurality of components is stacked"), i.e. claim 1 is a product-by-process claim. "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps". See MPEP § 2113. Therefore because all of the structure recited in claim 1 is present in the Schmid reference, claim 1 is included in the above 103(a) rejection.

Furthermore Schmid teaches in column 7, lines 35 et seq. that the seal is hardened (albeit not fully hardened) before assembly. So whether or not the limitation is afforded patentable weight or not Schmid is already teaching said recitation. Regardless of this it is also clear that Schmid teaches in column 5, line 24, that the seal is "rigid" which is just a synonym for hard. It is also noted that the instant specification only states that the seal is hardened, but does not provide a requisite degree of hardening, so therefore if the seal is hardened to any degree it reads on said limitation if said limitation is afforded patentable weight.

Schmid as described above teaches the claimed invention except for a spacing portion formed separately from the plurality of components (claim 1) and a retaining portion formed concave or convex toward the sealant (claim 11). With regards to these

features the Examiner has found no criticality of either of the above listed features in the instant specification. For Example in paragraph [0054] the first sentence describes that the spacing portion may be integrally or separately formed. There is no disclosure of whether one formation is more critical than the other and furthermore the discussion of separately forming is only mentioned in the first sentence of paragraph [0054] and is not even illustrated in the drawings. Also in paragraph [0056] it is stated that "Rather than being such a concave or convex portion, the retaining portion 33 may merely be a plane portion..." this too shows no criticality to the shape of the retaining portion. Therefore it would have been obvious to one having ordinary skill in the art to separately form the spacing portion of Schmid since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art (Nerwin v. Erlichman, 168 USPQ 177, 179) and it further would have been obvious to one having ordinary skill in the art to form the retaining portion in either a convex or concave shape since it has been held that a change in shape is generally recognized as being within the level of ordinary skill in the art (In re Dailey 149 USPQ 47, 50 (CCPA 1966) and Glue Co. v. Upton 97 US 3, 24 (USSC 1878)).

Regarding claim 3, Schmid teaches in figure 3b two retaining portions 55 that face each other on separators of the fuel cell stack. At the time of the invention it would have been obvious to one having ordinary skill in the art to combine the embodiments of Figure 3b and 4a to provide two retaining portions that face each other and a spacing portion since the combination of the two embodiments provides a predictable variation of the Schmid invention. See MPEP 2141 (III) Rationale A, KSR v. Teleflex (Supreme

Court 2007) and Boston Scientific Scimed Inc. v. Cordis Corp., 89 USPQ2d 1704 (Fed. Cir. 2009). It further would have been obvious to duplicate the retaining portion since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.

Regarding claim 8, Schmid teaches the claimed invention except for another spacing portion on another component. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide an additional spacing portion on another component of the fuel cell of Schmid, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8. It should be noted that due to the many different embodiments disclosed in the instant specification embodying, 1, 2, 3, 4...etc spacing portions on separate components of the fuel cell no criticality is shown for having two spacing portions.

Regarding claim 20, Schmid teaches that the seal material is a resin (i.e. polymer), which is inherently cross-linked and because the seal must be three dimensional given the fact that this is a three-dimensional world, the resin will also inherently be three-dimensionally cross-linked.

Regarding claim 22, as seen in figure 5a, Schmid teaches that the sealant 50 is disposed on both sides of manifold 30.

It is noted that claim 1 recite functional limitations of the intended use of removing and separating components of the fuel cell, it is submitted that Schmid is fully capable of being separated as recited in the instant claims, see MPEP 2114.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmid as applied to claim 1 above, and further in view of U.S. Pre-Grant Publication No. 2002/0197519 hereinafter Einhart.

Schmid does not teach that the retaining portion is concave or convex.

As seen in figures 8 and 9, Einhart teaches a concave retaining portion for a seal in a fuel cell assembly.

As stated above no criticality of the shape of the retaining portion has been found in the instant specification for said feature such as in paragraph [0056] wherein it states that "Rather than being such a concave or convex portion, the retaining portion 33 may merely be a plane portion..." and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to form the retaining portion in a concave shape in Schmid as taught by Einhart to provide a complex cross-sectional shape to retain the sealing material that provides a larger surface area for the sealing material to bond to and also since it has been held that a change in shape is generally recognized as being within the level of ordinary skill in the art (In re Dailey 149 USPQ 47, 50 (CCPA 1966) and Glue Co. v. Upton 97 US 3, 24 (USSC 1878)).

Claims 1, 3, 4, 8, 9, 11-14 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmid as discussed and applied above, and further in view of U.S. Pre-Grant Publication No. 2002/0031698 hereinafter Inoue.

Schmid teaches a pressure-sensitive adhesive material as discussed above but does not teach that the sealant is a gel.



Inoue teaches a fuel cell stack assembly comprising a plurality of components that are sealed together using a gel sealant (abstract and paragraph [0020]).

At the time of the invention it would have been obvious to one having ordinary skill in the art to substitute a gel sealant for the adhesive in Schmid as taught by Inoue in order to provide a uniform seal between the fuel cell components thereby making the sealing uniform and maintaining gas-tightness between the fuel cell components. Simple substitution of one known element (Inoue's Gel sealant) for another (Schmid's adhesive sealant) would achieve the predictable results of providing a uniform seal between the fuel cell components thereby making the sealing uniform and maintaining gas-tightness between the fuel cell components. See MPEP 2141 (III) Rationale B, KSR v. Teleflex (Supreme Court 2007).

It is submitted that the seal of Schmid as modified by Inoue is capable of being removable due to the breadth of "gel material" as recited in claim 1 and the burden is shifted to applicants to show in the form of evidence (not arguments) that the seal of Schmid as modified by Inoue does not exhibit the properties as recited in claim 1 that is that the sealant material can never be removed.

Claims 1, 3, 4, 8, 9, 11-14 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmid as discussed and applied above, and further in view of U.S. Patent No. 6,596,427 hereinafter Wozniczka.

Schmid teaches a pressure-sensitive adhesive material as discussed above but does not teach that the sealant is a high viscosity material such as a thermoplastic material.

Wozniczka teaches a fuel cell stack assembly comprising a plurality of components that are advantageously sealed together using a thermoplastic material (column 8, lines 43-47).

At the time of the invention it would have been obvious to one having ordinary skill in the art to substitute a thermoplastic sealant for the adhesive in Schmid as taught by Wozniczka in order to provide a seal that prevents edge shorts in the Membrane Electrode Assembly. Simple substitution of one known element (Wozniczka's Thermoplastic sealant) for another (Schmid's adhesive sealant) would achieve the predictable results of providing a seal that prevents edge shorts in the Membrane Electrode Assembly. See MPEP 2141 (III) Rationale B, KSR v. Teleflex (Supreme Court 2007).

It should be noted that in paragraph [0070] of the instant specification, thermoplastic material is disclosed as a preferred material for the sealant material. Therefore it is submitted that the seal of Schmid as modified by Wozniczka is in fact not only capable of being removable, it is in fact removable, since thermoplastic material is disclosed as a preferred material for the sealant by applicant and also due to the breadth of "high viscosity material" in the Markush groups and the burden is shifted to applicants to show in the form of evidence (not arguments) that the seal of Schmid as modified by Wozniczka does not exhibit the properties as recited in claim 1 that is that the sealant material can never be removed.

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmid and Inoue as discussed and applied above, and further in view of Einhart.

Schmid teaches a pressure-sensitive adhesive material as discussed above but does not teach that the sealant is a gel.

Inoue as discussed above is incorporated herein.

At the time of the invention it would have been obvious to one having ordinary skill in the art to substitute a gel sealant for the adhesive in Schmid as taught by Inoue in order to provide a uniform seal between the fuel cell components thereby making the sealing uniform and maintaining gas-tightness between the fuel cell components. Simple substitution of one known element (Inoue's Gel sealant) for another (Schmid's adhesive sealant) would achieve the predictable results of providing a uniform seal between the fuel cell components thereby making the sealing uniform and maintaining gas-tightness between the fuel cell components. See MPEP 2141 (III) Rationale B, KSR v. Teleflex (Supreme Court 2007).

It is submitted that the seal of Schmid as modified by Inoue is capable of being removable due to the breadth of "gel material" as recited in claim 1 and the burden is shifted to applicants to show in the form of evidence (not arguments) that the seal of Schmid as modified by Inoue does not exhibit the properties as recited in claim 1 that is that the sealant material can never be removed.

Schmid as modified by Inoue discloses the claimed invention except for a retaining portion that is tapered.

Einhardt teaches in figures 10-15 a retaining portion that is tapered.

Furthermore with regards to this feature the Examiner has found no criticality of the tapered shape in the instant specification. Therefore it would have been obvious to

one having ordinary skill in the art to form the retaining portion of Schmid as modified by Inoue such that it is tapered as taught by Einhart in order to provide a complex cross-sectional shape to retain the sealing material that provides a larger surface area for the sealing material to bond to and also since it has been held that a change in shape is generally recognized as being within the level of ordinary skill in the art (In re Dailey 149 USPQ 47, 50 (CCPA 1966) and Glue Co. v. Upton 97 US 3, 24 (USSC 1878)).

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmid and Wozniczka as discussed and applied above, and further in view of Einhart.

Schmid teaches a pressure-sensitive adhesive material as discussed above but does not teach that the sealant is a high viscosity material such as a thermoplastic material.

Wozniczka as discussed above is incorporated herein.

At the time of the invention it would have been obvious to one having ordinary skill in the art to substitute a thermoplastic sealant for the adhesive in Schmid as taught by Wozniczka in order to provide a seal that prevents edge shorts in the Membrane Electrode Assembly. Simple substitution of one known element (Wozniczka' Thermoplastic sealant) for another (Schmid's adhesive sealant) would achieve the predictable results of providing a seal that prevents edge shorts in the Membrane Electrode Assembly. See MPEP 2141 (III) Rationale B, KSR v. Teleflex (Supreme Court 2007).

It should be noted that in paragraph [0070] of the instant specification, thermoplastic material is disclosed as a preferred material for the sealant material.

Therefore it is submitted that the seal of Schmid as modified by Wozniczka is in fact not only capable of being removable, it is in fact removable, since thermoplastic material is disclosed as a preferred material for the sealant by applicant and also due to the breadth of "high viscosity material" in the Markush groups and the burden is shifted to applicants to show in the form of evidence (not arguments) that the seal of Schmid as modified by Wozniczka does not exhibit the properties as recited in claim 1 that is that the sealant material can never be removed.

Schmid as modified by Inoue discloses the claimed invention except for a retaining portion that is tapered.

Einhart teaches in figures 10-15 a retaining portion that is tapered.

Furthermore with regards to this feature the Examiner has found no criticality of the tapered shape in the instant specification. Therefore it would have been obvious to one having ordinary skill in the art to form the retaining portion of Schmid as modified by Wozniczka such that it is tapered as taught by Einhart in order to provide a complex cross-sectional shape to retain the sealing material that provides a larger surface area for the sealing material to bond to and also since it has been held that a change in shape is generally recognized as being within the level of ordinary skill in the art (In re Dailey 149 USPQ 47, 50 (CCPA 1966) and Glue Co. v. Upton 97 US 3, 24 (USSC 1878)).

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **ROBERT HODGE** whose telephone number is (571)272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert Hodge/  
Primary Examiner, Art Unit 1795